PENDING CLAIMS

The following listing of claims replaces all prior listings of claims:

Listing of Claims:

1. (Original) An assembly for monitoring ionising radiation, comprising:

a detector substrate for generating electronic charge responsive to incident ionising radiation, said detector substrate configured to form an array of ionising radiation sense volumes; and

a circuit substrate supporting an array of read-out circuits corresponding to said array of sense volumes: wherein

each of said read-out circuits is switchable between first and second charge integration modes for receiving charge from a corresponding sense volume, and includes a charge integration circuit configured in said first charge integration mode to integrate charge corresponding to sensing of a single ionising radiation detection event in a corresponding sense volume and configured in said second charge integrating mode to integrate charge corresponding to sensing a plurality of ionising radiation detection events in said corresponding sense volume.

2. (Original) An assembly according to Claim 1, wherein each of said read-out circuits comprises first and second capacitances, each of said read-out circuits switchable between said first and second modes for accumulating charge in first and second capacitances respectively.

3. (Original) An assembly according to Claim 2, wherein said first capacitance is configured to be sufficient to provide a statistical likelihood of accumulating charge corresponding to a single detection event in said corresponding sense volume.

4. (Original) An assembly according to Claim 3, wherein said second capacitance is configured to be sufficient to provide a statistical likelihood of accumulating charge corresponding to a plurality of detection events in said corresponding sense volume.

5. (Previously Presented) An assembly of Claim 2, wherein said capacitance in said second mode comprises a first capacitor and second capacitor, said assembly operative to accumulate charge on said first capacitor alone and to switchably couple said second capacitor to said first capacitor for providing a greater capacitance near to saturation of said first capacitor.

6. (Previously Presented) An assembly according to Claim 1, wherein said read-out circuits comprise means for switching between said first and second modes.

7. (Previously Presented) An assembly according to Claim 1, wherein said read-out circuits comprise circuitry for reading out charge accumulated in respective first and second capacitances.

8. (Previously Presented) An assembly according to Claim 1, wherein said circuits comprise reset circuitry for discharging said capacitances subsequent to read-out of charge thereon.

9. -14. (Cancelled)

15. (Previously Presented) An assembly according to Claim 1, wherein said detector substrate comprises a semi-conductor material.

16. (Previously Presented) An assembly according to Claim 1, further comprising conductive material disposed over a first surface of said detector substrate, and an array of conductive pads formed over a second surface of said detector substrate opposing said first surface for forming said array of said sense volumes, and wherein each of said array of conductive pads is electrically coupled to corresponding ones of said array of charge storage circuits of said circuit substrate.

17. (Original) An assembly according to Claim 16, configurable in use to apply a bias signal between said conductive material and said conductive pads.

18. (Previously Presented) An assembly according to Claim 16, wherein said semi-conductor material comprises one of cadmium telluride (C_dT_e), cadmium zinc telluride ($C_dZ_nT_e$), silicon (S_i), amorphous silicon or Gallium Arsenide (G_aA_s).

19. (Previously Presented) An assembly according to Claim 1, wherein said circuit substrate comprises semi-conductor material.

20. (Original) An assembly according to Claim 19, wherein said circuit substrate supports CMOS circuitry.

21. (Previously Presented) An assembly according to Claim 16, wherein said sense volumes comprise a cross-section area in the range between 20μm x 20μm x 0.25mm to 2mm x 2mm x 5mm.

22. (Previously Presented) An assembly according to Claim 21, wherein the cross-sectional surface area of each of said conductive pads is in the range 15μm x 15μm to 1.95mm x 1.95mm

23. (Previously Presented) The assembly of Claim 1, further comprising a semi-conductor detector substrate crystal configured with a plurality of ionising radiation sense volumes, said detector substrate crystal supporting conductive material across a first surface thereof and an array of conductive pads disposed across a second surface thereof opposing said first surface thereby defining said plurality of sense volumes.

24. (Original) An ionising radiation dosimitor, comprising a semi-conductor detector substrate crystal configured with a plurality of ionising radiation sense volumes, said detector substrate crystal supporting conductive material across a first surface thereof and an array of conductive pads disposed across a second surface thereof opposing said first surface thereby defining said plurality of sense volumes, and further comprising a circuit substrate configured to receive charge from said ionising radiation detector substrate, said circuit substrate comprising an array of read-out circuits each of said read-out circuits switchable between first and second charge accumulation modes, said first

charge accumulation mode operable to accumulate charge corresponding to a single detection event and said second charge accumulation mode operable to accumulate charge corresponding to a plurality of detection events.

25. (Original) A circuit substrate for a dosimitor according to Claim 23, configured to receive charge from said ionising radiation detector substrate, said circuit substrate comprising an array of read-out circuits including photon counting circuitry electronically configurable to respond to a current pulse corresponding to the detection in a detector substrate of ionising radiation in a first energy range to increment a first count value or to respond to a current pulse corresponding to the detection in a detector substrate of ionising radiation in a second energy range to increment a second count value.

26. (Previously Presented) A method for operating an assembly according to Claim 1 the method comprising:

a) integrating charge corresponding to sensing of a single ionising radiation event; and

b) non-coincidental with step a) integrating charge corresponding to sensing of multiple ionising radiation events.

27. (Original) A method according to Claim 26, wherein step a) includes accumulating charge in a first capacitance suitable for accumulating charge corresponding to said single detection event, and wherein step b) includes accumulating charge in a second capacitance suitable for accumulating charge corresponding to said multiple detection events.

28. (Original) A method according to Claim 27, wherein said second capacitance comprises first and second capacitors, said first capacitor disposed between said second capacitor and detector substrate and said second capacitor between said first capacitor and read-out line, the method comprising accumulating charge in said first capacitor,

switching said second capacitor into electrical connection with first said capacitor near to saturation of said first capacitor for accumulating full charge.

29. (Previously Presented) A method of reading accumulated charge from an assembly operating in accordance with Claim 26, said method comprising interleaving reading charge corresponding to a single ionising detection event with reading charge corresponding to multiple detection of events.

30.-32. (Cancelled)

33. (Previously Presented) An assembly according to Claim 1, wherein the assembly is part of an ionising radiation monitoring device in a radiation monitoring network, the network further comprising:

a communications unit for communicating at least radiation data corresponding to radiation sensed by said device over a communications network; and

a control station configured to receive said radiation data from said device.

34. (Original) An ionising radiation monitoring network according to Claim 33, wherein said at least one device is configured to provide radiation data including spectroscopic data representative of the energy of said sensed radiation, and to transmit said spectroscopic data to said control station.

35. (Previously Presented) An ionising radiation monitoring network according to Claim 33, wherein said at least one ionising radiation monitoring device includes a bi-directional communications unit for receiving at least voice data from said control station.

36. (Previously Presented) An ionising radiation monitoring network according to Claim 33, said device further comprising position sensing circuitry operable to transmit position data to said control station, and wherein said control station is configured to associate said device, radiation data and positional data together for presentation to a user of said control station.

37. (Previously Presented) An ionising radiation monitoring network according to Claim 36, wherein said positional circuitry comprises circuitry for receiving positional data from a satellite global positioning system or other wireless positional information provider.

38. (Previously Presented) An ionising radiation monitoring network according to Claim 36, wherein said device periodically communicates said position data and radiation data to said control station.

39. (Previously Presented) An ionising radiation monitoring network according to Claim 33, wherein said device is a portable device.

40. (Previously Presented) An ionising radiation monitoring network according to Claim 33, wherein said device comprises a wireless communications unit.

41. (Previously Presented) An ionising radiation monitoring network according to Claim 33, further comprising a plurality of ionising radiation monitoring devices.

42. (Previously Presented) An ionising radiation monitoring network according to Claim 36, wherein said control station is configured to plot at least radiation data and position received from one or more said devices.

43. (Original) An ionising radiation monitoring network according to Claim 41, wherein said control station is configured to provide a geographic display of said radiation and positional data to a user of said control station on a map representative of said network area.

44. (Previously Presented) An ionising radiation monitoring network according to Claim 40, wherein said control station plots an identity of a device associated with each position radiation data.

45. (Previously Presented) A method according to Claim 26, the method further comprising:

receiving spectroscopic data representative of the energy of sensed radiation from a remote ionising radiation sensor over a communications network; and

automatically determining from said spectroscopic data if said radiation is hazardous and issuing a warning signal if said radiation is hazardous.

46. (Original) A method according to Claim 45 further comprising transmitting a warning to said ionising radiation sensor for alerting a user of said sensor to the presence of hazardous radiation.

47. (Original) A method according to Claim 46, further comprising issuing voice commands to a user of said radiation sensor.

48. (Original) A method according to Claim 46, further comprising responding to voice commands to a user of said radiation sensor.

49. (Previously Presented) A method according to Claim 45, further comprising monitoring the position of said ionising radiation sensor, and displaying said position and data indicative of said sensed radiation corresponding to said position for providing "plume" analysis of a radiation contaminated environment.

50.-56. (Cancelled)

57. (Previously Presented) An assembly according to Claim 1, wherein said sense volumes comprise a cross-section area in the range between 20μm x 20μm x 0.25mm to 2mm x 2mm x 5mm.

58.-64. (Cancelled)